

125

BARRETT'S HAND BOOK



FOR
ARCHITECTS, & ENGINEERS,
AND BUILDERS

PRICE 50 CENTS

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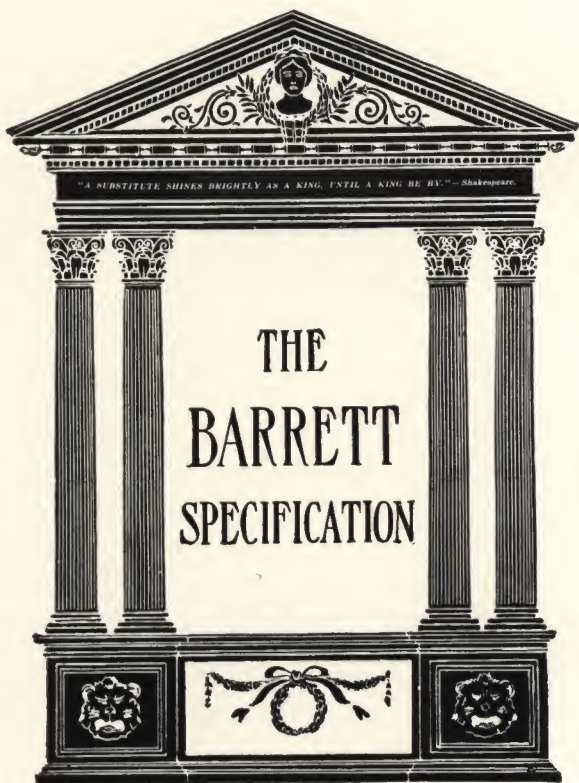
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*“A substitute shines brightly as a King,
until a King be by.”*—SHAKESPEARE.



EXPERIENCE
is the great teacher
KNOWLEDGE
thus acquired is the
POWER
which, skillfully applied, attains
SUCCESS

*From such is evolved the
Barrett Hand Book for
Architects and Engineers*



THE BARRETT HAND BOOK

THE object of this Hand Book is to carefully and fully describe the many and varied uses of Coal Tar Pitch and Tarred Felt in building construction, and to place before Architects, Engineers, Builders and Owners a series of Standard Roofing Specifications.

The accompanying Specifications represent the results of over fifty years actual experience of the most prominent and successful contractors and professional men.

We also furnish information regarding many points of interest in connection with the general subject of Roofing and Waterproofing, including reliable data regarding the proper pitch of a roof, at which the best and most economical results can be obtained, all things considered.

THE STANDARD BARRETT THE WORLD SPECIFICATIONS OVER

THE following specifications are generally recognized as standard and strictly in accordance with the most advanced methods of the day. All bear the Barrett name, to differentiate them from others hastily and often inaccurately prepared, or calling for some particular brand of materials.

The Barrett Specifications call for the *best* materials only. They have been prepared solely from the view point of getting absolutely the very best results obtainable.

For such Architects, Engineers and Owners who may have used Coal Tar Pitch and Tarred Felt for Roofing or Waterproofing with disappointing results, we quote from the special report of Edward Atkinson, President of the Boston Manufacturers' Mutual Fire Insurance Company, on "Outside Covering for Flat Roofs."

“We are very often consulted as to what covering shall be placed upon the outside of a flat roof. It often happens that those who have used tin desire to change to composition, those who have used composition desire to change to tin, others who have used both, desire something else.” (Also from the same document) “This will happen if owners make bargains with *irresponsible contractors* at prices at which the best materials cannot be afforded.”

Had Mr. Atkinson included “methods” with “materials” in this last quotation, he would have fully covered the cause of any unsatisfactory results from the use of Coal Tar Pitch and Tarred Felt in structural work, where time, the true demonstrator has proved them to be without an equal when used with intelligence and integrity.

THEREFORE, to the Architect, Engineer or Owner who desires to use any of these Specifications, we would say, confine the bidding to Roofing or Water-proofing Contractors, whose experience and reputation is a satisfactory guarantee and safeguard for intelligent and honest interpretation and execution.

We are at all times prepared to submit additional information on the subject of either Roofing or Waterproofing, and to substantiate our position further in any way that may be desired.

We should be very glad to hear from Architects and Engineers regarding these Specifications, and will welcome criticism or suggestions.

All such communications should be addressed to
THE SPECIFICATION DEPARTMENT of the
BARRETT MANUFACTURING COMPANY,
17 Battery Place, New York City.



THE BARRETT

SPECIFICATION

*Over
Boards*

FOR STANDARD SLAG OR GRAVEL ROOFING

THE first Specification presented is for a Standard Slag or Gravel Roof laid over boards. A Roof of this kind is adapted for use on all kinds of buildings (except where the roof is very steep), and is pre-eminently the best for most purposes. Its cost per year of service is much less than any other form of reliable roof covering known. As compared with Tin and Metal Roofing, it is immeasurably superior and more economical, as it requires no painting and no repairs of any kind for years after it has been laid. In fact, any reputable contractor will *guarantee* such a roof for at least *ten years*. This may seem a long time, but experience has proven that, with ordinary care, most roofs laid according to this Specification will give good service for nearer *twenty years*.

The Barrett Specification for Standard Slag or Gravel Roofing

(OVER BOARDS)

(To follow description of Roof Sheathing.)

Over the foregoing shall be laid a (5) ply Coal Tar Pitch, Felt, and Slag or Gravel Roof, to be constructed as follows:

The Rosin Sized Sheathing Paper or Unsaturated Felt to be used shall weigh not less than five (5) pounds per one hundred square feet.

The Tarred Felt shall weigh not less than fourteen (14) pounds per one hundred square feet, single thickness.

The Pitch shall be the best quality of straight run coal tar pitch, distilled direct from American coal tar, and there shall be used not less than one hundred and twenty (120) pounds (gross weight) per one hundred square feet of completed roof.

The nailing shall be done with threepenny barbed wire roofing nails driven through tin discs.

The Slag or Gravel shall be of such a grade that no particles shall exceed five-eighths ($\frac{5}{8}$) of an inch or be less than one-fourth ($\frac{1}{4}$) of an inch in size. It shall be dry and free from dust and dirt. In cold weather it must be heated immediately before using. Not less than three hundred (300) pounds of Slag or four hundred (400) pounds of Gravel shall be used per one hundred square feet.

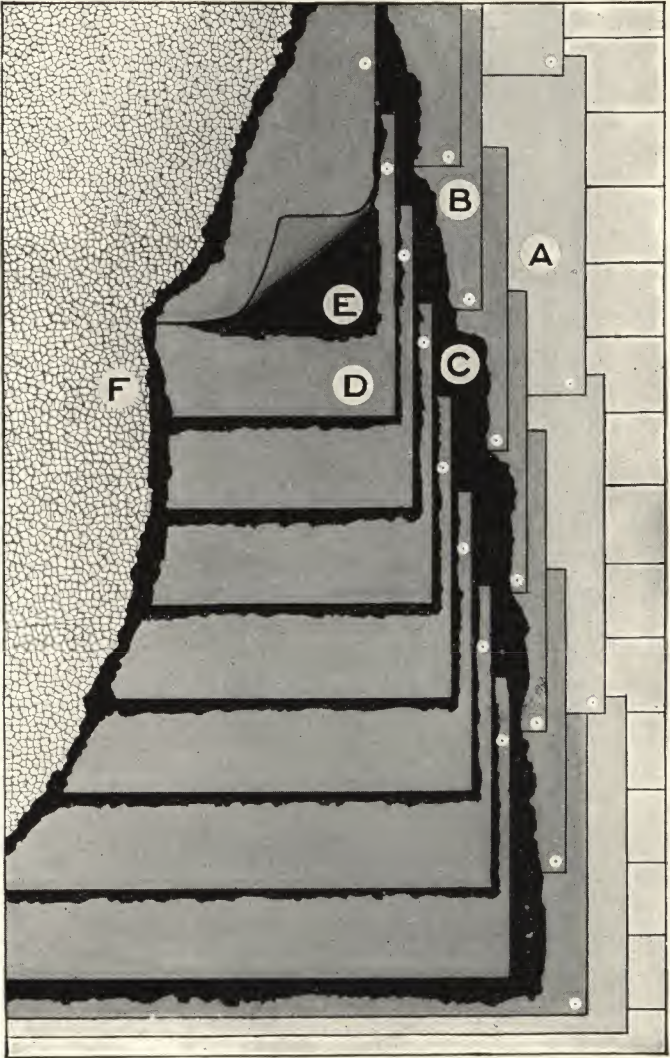
The materials shall be used as follows:

First lay one thickness of Rosin Sized Sheathing Paper or Unsaturated Felt (A), lapping each sheet one inch over the preceding one, and nailing only so often as may be necessary to hold in place until covered with the Tarred Felt (B), and the nailing may be omitted entirely if practicable.

Over the Rosin Sized Sheathing or Unsaturated Felt lay two (2) full thicknesses of Tarred Felt (B), lapping each sheet seventeen (17) inches over the preceding one, and nailing along the exposed edges of the sheets only so often as may be necessary to hold the sheets in place until the remaining Felt can be applied.

Over the entire surface of the Felt thus laid, spread a uniform coating of Pitch (C), mopped on. Then lay three (3) full thicknesses of Felt (D), lapping each sheet twenty-two (22) inches over the preceding one, and nailing, as laid, every three (3) feet, not more than ten (10) inches from the upper edge.

When the felt is thus laid and secured mop back with pitch (E) the full width of twenty-two (22) inches under each lap. Then spread over the entire surface of the roof a uniform coating of Pitch, into which, while hot, embed Slag or Gravel (F).



THE BARRETT *Over Concrete* SPECIFICATION FOR STANDARD SLAG OR GRAVEL ROOFING

(To follow description of Concrete, which should be smooth and perfectly graded to carry water to outlet or gutter.)

Over the foregoing shall be laid a five (5) ply Coal Tar Pitch, Felt and Slag or Gravel Roof to be constructed as follows:

The Felt shall weigh not less than fourteen (14) pounds per one hundred square feet, single thickness.

The Pitch shall be the best quality of straight-run coal tar pitch, distilled direct from American coal tar, and there shall be used not less than two hundred (200) pounds (gross weight) per one hundred square feet of completed roof.

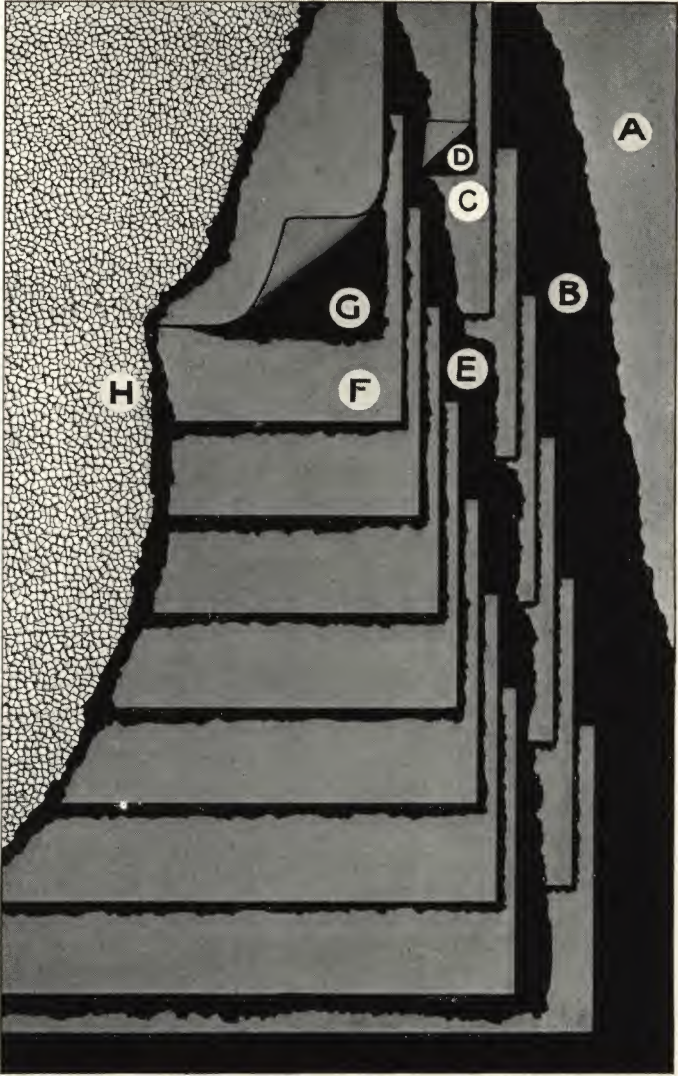
The Slag or Gravel shall be of such a grade that no particles shall exceed five-eighths ($\frac{5}{8}$) of an inch or be less than one-quarter ($\frac{1}{4}$) of an inch in size. It shall be dry and free from dust or dirt. In cold weather it must be heated immediately before using. Not less than three hundred (300) pounds of slag or four hundred (400) pounds of gravel shall be used per one hundred square feet.

The materials shall be used as follows:

First coat the concrete (A) with hot pitch (B) mopped on uniformly. Over the above coating of Pitch lay two thicknesses of Tarred Felt (C), lapping each sheet seventeen (17) inches over the preceding one and mopping back with Pitch (D) the full width of each lap.

Over the Felt thus laid spread a uniform coating of Pitch (E) mopped on. Then lay three (3) full thicknesses of Felt (F), lapping each sheet twenty-two (22) inches over the preceding one.

When the Felt is thus laid, mop back with Pitch (G) the full width of twenty-two (22) inches under each lap. Then spread over the entire surface of the roof a uniform coating of Pitch, into which, while hot, embed Slag or Gravel (H).



THE BARRETT SPECIFICATION

*For
Vitrified
Tile or Brick
Roofing*

The third Specification is for Vitrified Tile or Brick Roofing, such as is used mainly on massive fireproof structures of the first class.

(To follow description of Concrete, which should be smooth and perfectly graded to carry water to outlet or gutter.)

Over the foregoing shall be laid a five (5) ply Coal Tar Pitch, Felt and Vitrified Tile or Brick Roof, to be constructed as follows:

The Felt shall weigh not less than (14) pounds per one hundred square feet, single thickness.

The Pitch shall be the best quality of straight-run coal tar pitch, distilled direct from American coal tar, and there shall be used not less than two hundred (200) pounds (gross weight) per one hundred square feet of completed roof.

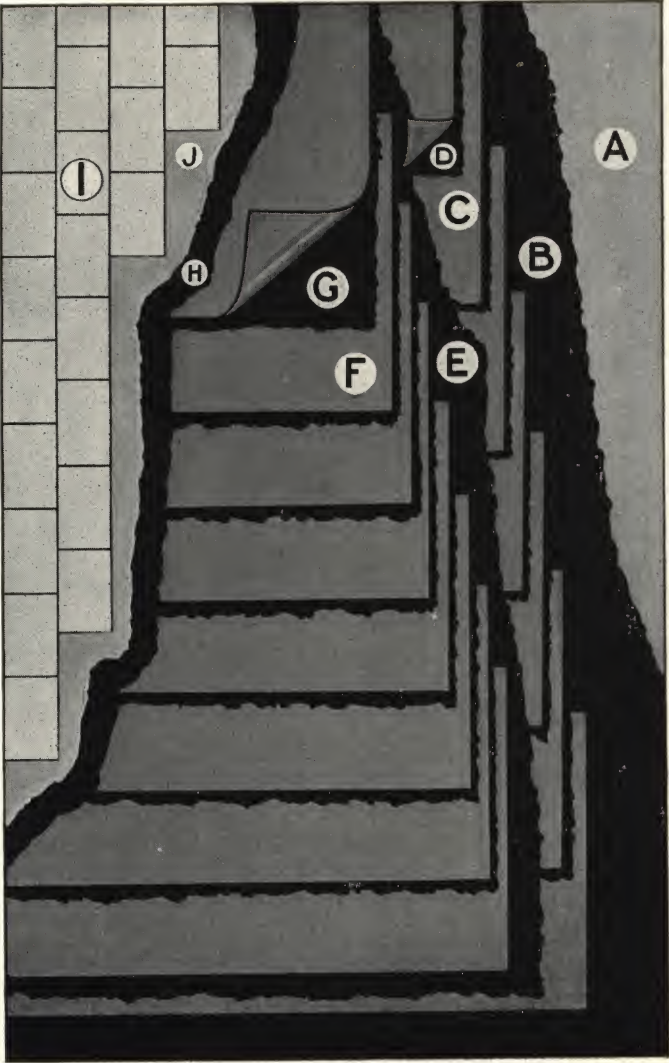
The materials shall be used as follows:

First coat the Concrete (A) with hot Pitch (B) mopped on uniformly. Over the above coating of Pitch lay two thicknesses of Tarred Felt (C), lapping each sheet seventeen (17) inches over the preceding one and mopping back with Pitch (D) the full width of each lap.

Over the Felt thus laid spread a uniform coating of Pitch (E) mopped on. Then lay three (3) full thicknesses of Felt (F), lapping each sheet twenty-two (22) inches over the preceding one.

When the felt is thus laid, mop back with Pitch (G) the full width of twenty-two (22) inches under each lap. Then coat the entire surface with Pitch (H) uniformly mopped on and finish with a course of vitrified clay tiles (I) 6 x 9 x 1 laid in and thoroughly grouted with Portland Cement mortar (J).

NOTE—Same general specification applies where Brick are used instead of Vitrified Clay Tiles.



Economite TILE ROOFING

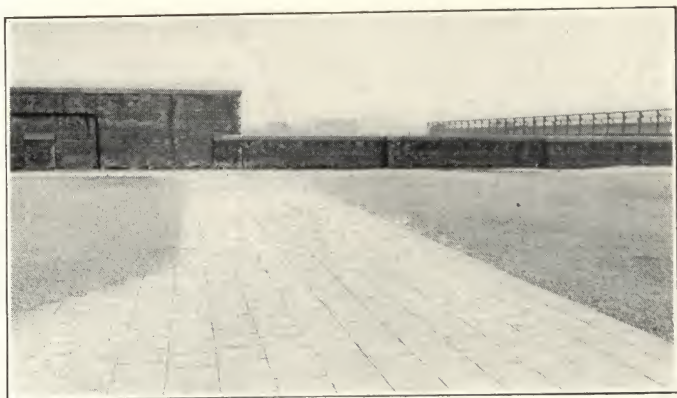
THE three foregoing Specifications have been standards for many years. Slag and Gravel roofs are used on all kinds of buildings; Vitrified

Tiles and brick are used mainly on massive fire-proof structures of the first class. As Vitrified Tile or brick roofs are costly and heavy, an urgent demand for a



smooth surfaced, light weight roof of moderate cost, suitable for all kinds of flat roofed buildings has been most satisfactorily met by the introduction a few years ago of "Economite Tile Roofing," the proper Specification for which follows on page 18 and 19.





The above photograph shows a view of the roof of the North German Lloyd Bulkhead Warehouse, Hoboken, N. J. This roof is laid according to the Barrett Specification, being of five ply Felt, Pitch and Gravel, and the walks of Economite Tiles. This method of construction is becoming exceedingly popular for certain classes of structures.

THE *Barrett* SPECIFICATION

Finished with Economite Tiles

(To follow description of Roof Sheathing.)

Over the foregoing shall be laid a five (5) ply Coal Tar Pitch, Felt and Economite Tile Roof to be constructed as follows:

The Rosin Sized Sheathing Paper or Unsaturated Felt to be used shall weigh not less than five (5) pounds per one hundred square feet.

The Felt shall weigh not less than fourteen (14) pounds per one hundred square feet, single thickness.

The Pitch shall be the best quality of straight run coal tar pitch, distilled direct from American coal tar, and there shall be used not less than one hundred and twenty (120) pounds (gross weight) per one hundred square feet of completed roof.

The nailing shall be done with threepenny barbed wire roofing nails driven through tin discs.

The materials shall be used as follows:

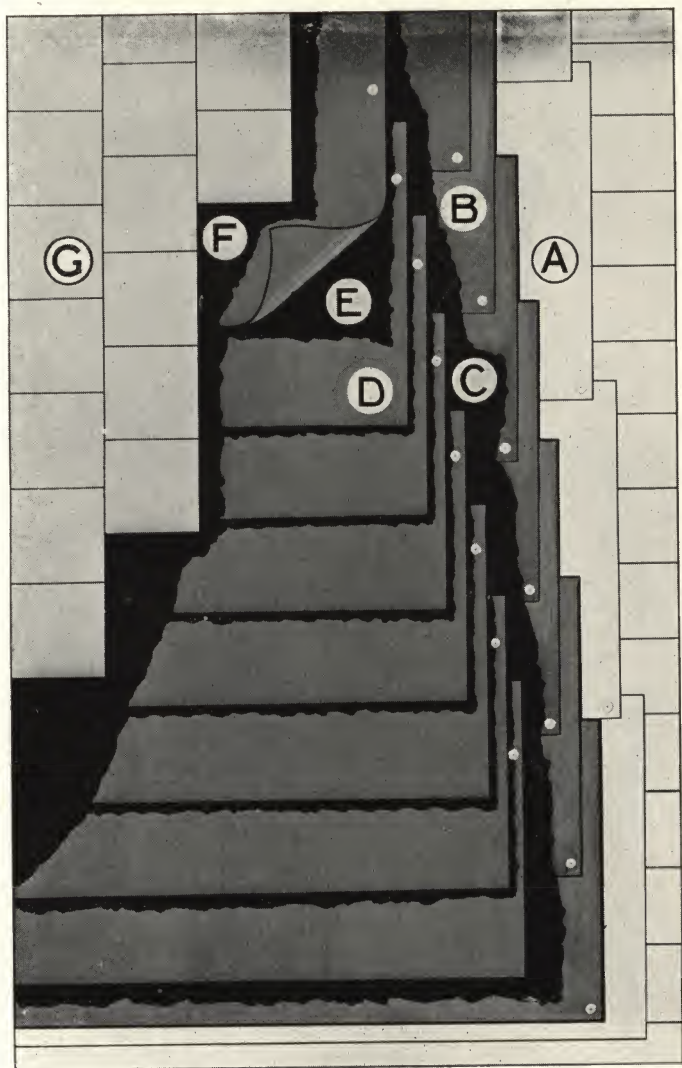
First lay one thickness of Rosin Sized Sheathing Paper or Unsaturated Felt (A), lapping each sheet one inch over the preceding one, and nailing only so often as may be necessary to hold in place until covered with the Tarred Felt (B), and the nailing may be omitted entirely if practicable.

Over the Rosin Sized Sheathing or Unsaturated Felt lay two (2) full thicknesses of Tarred Felt (B), lapping each sheet seventeen (17) inches over the preceding one, and nailing along the exposed edges of the sheets only so often as may be necessary to hold the sheets in place until the remaining Felt can be applied.

Over the entire surface of the Felt thus laid, spread a uniform coating of Pitch (C), mopped on. Then lay three (3) full thicknesses of Felt (D), lapping each sheet twenty-two (22) inches over the preceding one, and nailing, as laid, every three (3) feet, not more than ten (10) inches from the upper edge.

When the Felt is thus laid and secured, mop back with Pitch (E) the full width of twenty-two (22) inches under each lap. Then finish with a course of Bituminous Concrete Tiles 10x10½ inch laid in a thin coat of Coal Tar Pitch Coating as prepared for same by the Barrett Manufacturing Company.

NOTE.—When this roofing is laid over Concrete, apply the Felt and Pitch foundation as directed in "Barrett Specification over Concrete."



Concerning the proper pitch for a roof

*at which
the best
results
are
obtained*

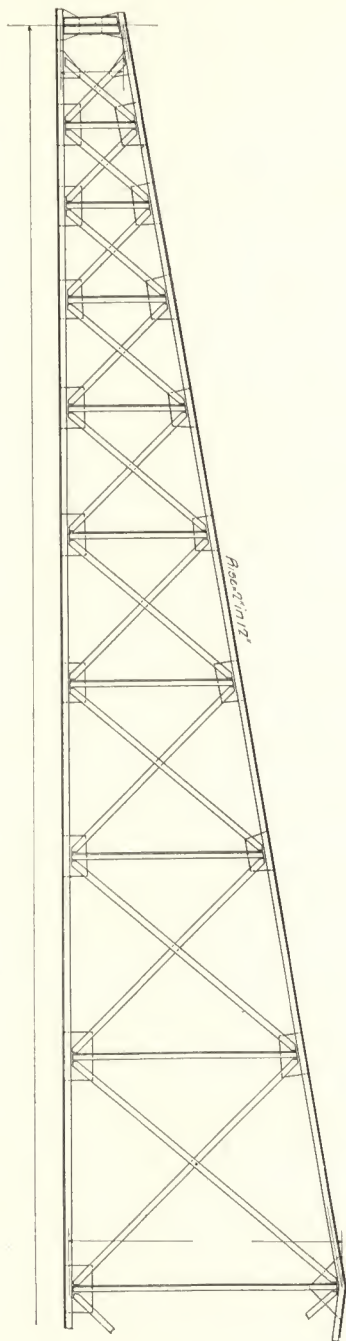
BY natural instinct, born in the early days of the thatched roof and bred through the succeeding eras of slabs, shingles, slate and other roof coverings, man felt that there must be considerable pitch to the roof to carry the water away swiftly, else it would get through the covering. The inertia of a natural instinct thus firmly rooted is slow to overcome. While it is desirable for architectural effect that many buildings have steep roofs and be covered with Ready-Roofing, Shingles, Slate, Tile or Metal, as best suits particular cases, we contend that for commercial purposes, mills, warehouses, and similar constructions, roofs are frequently made too steep, from no other cause or reason than this old instinct. Of course they must be steep, if Ready-Roofing, Shingles or Slate are to be used, but as it has been clearly demonstrated in the last fifty years that a Barrett Specification Roof for Manufacturing, Railway or Commercial buildings is the most economical weatherproof and fire retardant roof obtainable, why not furnish a foundation for it, on which the roof contractor can do his best for the least cost per square foot?

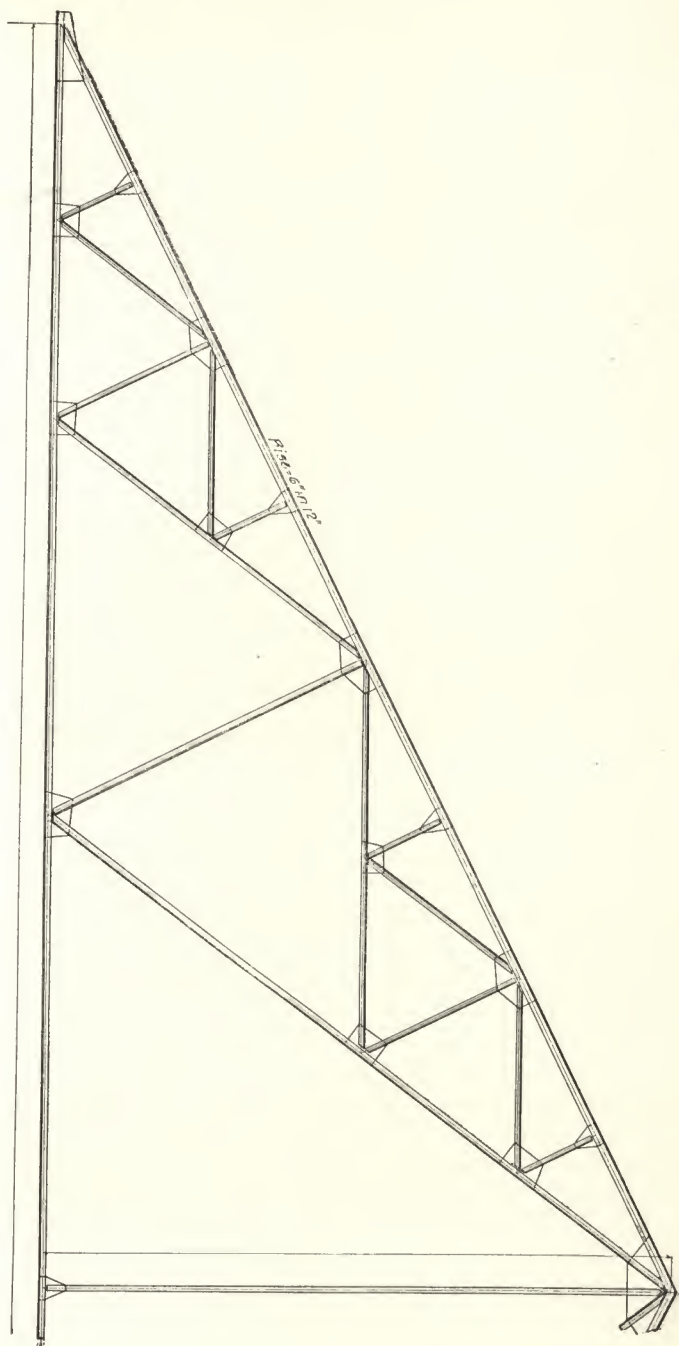
WE are advised by eminent authority on the construction of roof trusses that for all ordinary spans and with the usual spacing or length of bays, that trusses with a comparatively flat top chord, say two inches to the foot, can be designed as economically as the conventional Fink truss with the steep top chord. (See pages 22 and 23.)

The best results are obtainable with a Barrett slag or gravel roof, at not over two inches to the foot and this is readily obtainable with a truss as shown on page 22. As compared with steeper pitches, the slight pitch of this truss enables the roof contractor to use the maximum quantity of material at the minimum labor cost for any given area and as compared with a pitch of six inches to the foot, there is about eleven per cent less area of purlins, roof plank and roofing. The work thus planned, therefore, has the advantages of economy and increased durability.

From an insurance stand-point, flat roofs are looked upon with greater favor than steep ones. Moreover, this form of roof truss permits strong longitudinal bracing if desired for the support of shafting, traveling cranes, etc., which it may be found desirable to attach to the roof—an advantage nearly impracticable in a steep truss such as is shown on page 23.

We are, however, aware of the necessity for steep roofs on the backs of the skylights in "Sawtooth" Mill construction. Of the various materials and methods used in the last fifteen years, on this class of work, the best results have been obtained along the lines of the five-ply Barrett Specification.





TV *New York* **BARRETT**

THE accompanying Skyline Views of New York and Chicago include the following to commercial buildings. The value of these buildings and the land upon which they stand

What more convincing proof can be given of the value of Coal Tar Pitch and Tarred Felt when applied to roofs of buildings which are Roofed or Waterproofed with Tarred Felt and Coal Tar Pitch?

The roofs in practically all the cases have been laid along the lines and in accordance with the plans of the architects. (See the foundation walls, cellars and vault arches, has been similarly applied. (See



NEW YORK

On some of the modern fireproof buildings the roofs are finished with Tarred Felt and Pitch, but the majority are finished with a covering of Slag or

The Pennsylvania Freight Warehouses in the foreground were roofed with Tarred Felt and Pitch. In fact, many others show a similar record of service and satisfaction.



CHICAGO

It is safe to say that there are to-day thousands of Coal Tar Pitch, Felt and Tarred Felt roofs, twenty years, with absolutely no repairs or attention of any kind—a record unequalled in the history of building.

In fact, Coal Tar Pitch and Tarred Felt have proved themselves to be the most durable and economical of all roof coverings of over fifty years, in which time they have lived down all substitutes and imitations.

NO SKYLINES *Chicago*

est specimens of modern architecture and engineering in the world, as applied
on which they stand represents hundreds of millions of dollars.

far Products than the fact that all the large buildings in these photographs

located in **THE BARRETT SPECIFICATION**, and the waterproofing of
Barrett Specification Over Concrete.)



WORK

course of Vitrified Tile or Brick, laid in Portland Cement over the five-ply
Gravel.

and with Coal Tar Pitch, Felt and Gravel more than thirty years ago, and



GO

and Gravel Roofs in various parts of the country, which have endured for over
ed by any other form of roof covering.

the best materials for Roofing and Waterproofing by a successful record
ions. No other material used for this purpose has such a record.

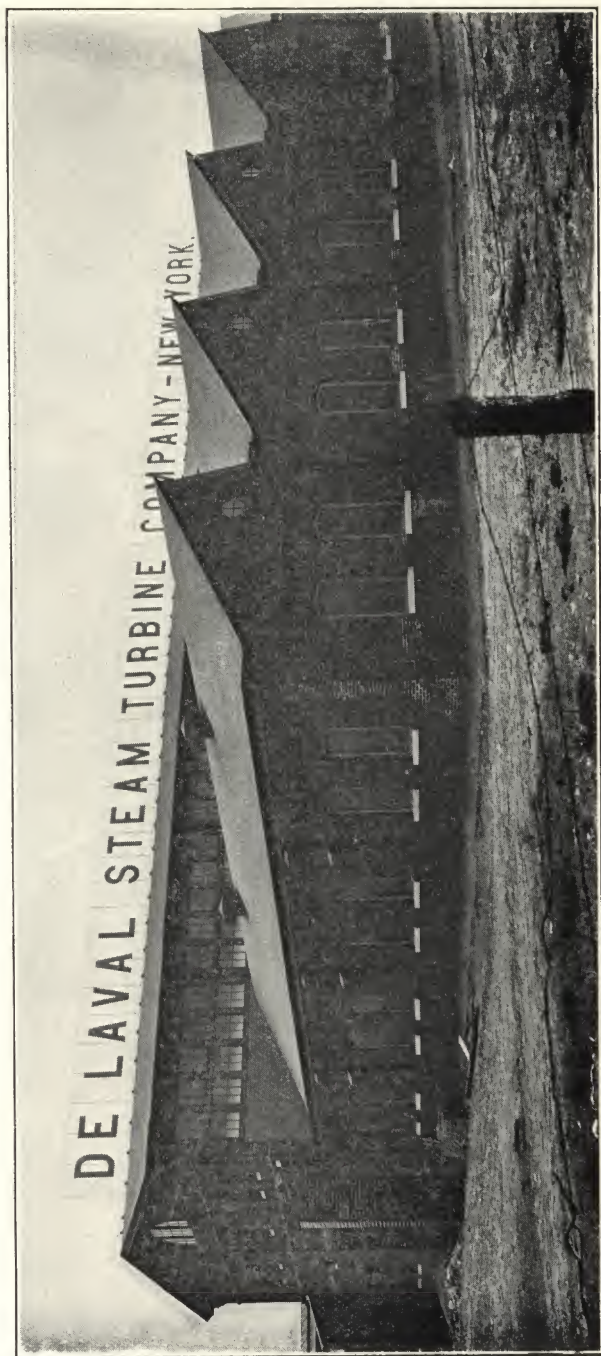
SAW TOOTH ROOFS ~ ~ ~

THE photograph on the following page shows the "Sawtooth" construction on a mill erected in 1901 having a pitch of $5\frac{1}{2}$ inches to the foot.

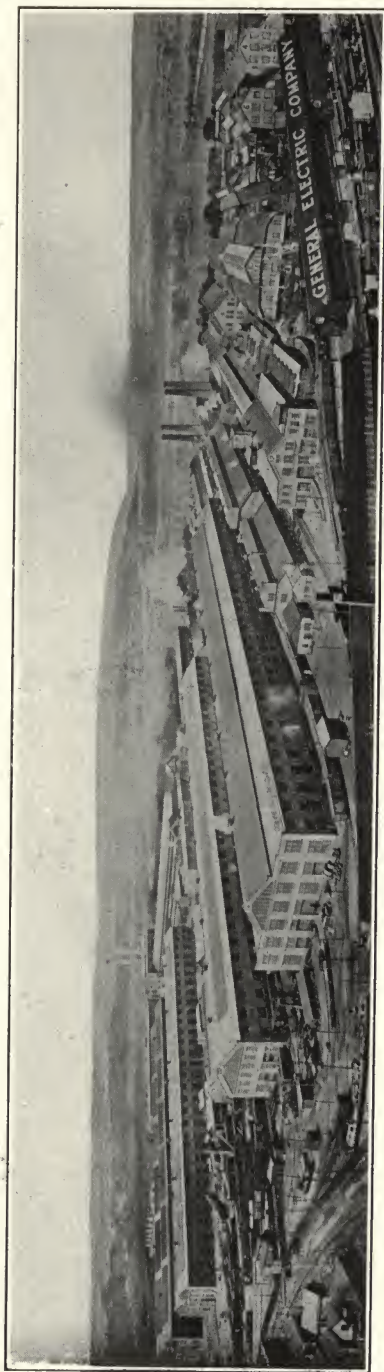
Where the pitch of such a roof does not exceed $4\frac{1}{2}$ inches to the foot, follow the Barrett Specification using Slag.

At over $4\frac{1}{2}$ inches keep the pitch of the roof down to the lowest point consistent with the area of skylight required and consult an experienced roof contractor, as the Specification must necessarily vary with the pitch of the roof.

Good results can be shown by experienced contractors at 12 inches to the foot (45 degrees) but as you increase the pitch, you increase the cost per square foot.



These Buildings are covered with ONE MILLION SQUARE FEET of Coal Tar Pitch, Felt, and Slag or Gravel Roofs



GENERAL ELECTRIC COMPANY

METAL FLASHINGS

*Their proper connection with a
Barrett Specification Roof*

WHILE the foregoing Specifications have treated fully on the materials and workmanship for a Slag, Gravel or Tile Roof proper, it is also important to have parapet walls, chimneys, skylight and scuttle curbs flashed with metal and such flashings properly connected with the flat roof covering. The following photograph shows copper flashing



against a brick wall with a four-inch flange turned out over the felt roof. The gutter shown in the same photograph has a four-inch flange, which flanges are securely nailed down and then a strip of Tarred Felt is cemented down over the nail heads in hot pitch, over which the final coat of hot pitch and slag or gravel is spread to the wall, or gutter stop line. Metal gutters to connect with slag or gravel roofs require what is known as a gravel stop, which is shown in the cut, to hold the pitch and gravel, which stop is usually $\frac{1}{2}$ to $\frac{5}{8}$ -inch high.

THE following photograph shows a skylight properly flashed ready to receive the felt strip over the joint. The roof shown is felted and ready for the final coat of pitch and slag, after the flashing flange has been covered with the pitch and felt strip.



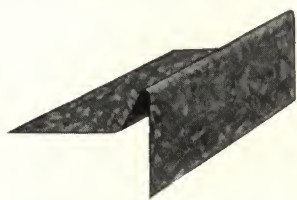
While the foregoing photographs show copper flashings in one piece of metal, in the best practice against brick walls where the roof is laid over wooden beams the flashing metal is used in two strips, base and cap. The cap should be built in the wall not less than 2 inches with a downward flange of about four inches as shown in the following illustration.

The base piece which turns out four inches on the flat stands up against the wall 6 to 10 inches and under the cap about 2 or 3 inches, thus fully providing for the shrinkage of the roof beams and boards.



At the eaves of roofs where there are no gutters, it is customary with some roof contractors to finish with a wooden eave strip which rots

in a few years. The best practice calls for a metal strip of galvanized iron or copper, formed thus. The inward flange is nailed over the foundation felt and



stripped with pitch and felt, as shown in the flashing photograph. The outward flange or face may be of any width to form a perfect drip from the fascia.

APPROXIMATE COSTS

APPROXIMATELY, the square foot prices of the various roofs herein are as follows, but it must be borne in mind that the area to be covered at one operation, location of the work, time of year and labor conditions of the locality, all have their respective influence on the cost.

BARRETT SPECIFICATION ROOFS

	Weight to sq. ft.	Price per sq. ft.
Slag over Boards, flat.....	5 lbs.....	5 to 6½c.
Gravel over Boards “.....	6 lbs.....	5 to 6½c.
Slag “ “ Steep.....	4 lbs.....	6 to 7½c.
Slag over Concrete, flat.....	5½ lbs.....	6 to 7½c.
Gravel over Concrete, flat....	6½ lbs.....	6 to 7½c.
Vitrified Tile over Concrete, flat.....	24 lbs.....	26 to 30c.
Brick over Concrete, flat.....	34 lbs.....	30 to 35c.
Economite Tile over Boards, flat.....	7½ lbs.....	13 to 16c.
Economite Tile over Concrete, flat....	8 lbs.....	15 to 18c.

These approximate prices are exclusive of metal flashings. They cover only the work shown on diagrams which accompany the Specifications.

WATERPROOFING

*for Cellars, Foundation Walls, Vault
Arches, Tunnels and Underground Structures*

THE general use of Coal Tar Pitch and Tarred Felt for waterproofing cellars, foundation walls, vault arches, tunnels and underground structures generally, is of more recent origin than for roofing. Thirty years ago it was the exception to waterproof foundations while to-day it is the rule.

Within our experience, we have had opportunity and occasion to watch the growth and development of this important branch of the building industry, and to note the results of the various experiments which have been made with "asphalts" and other materials for this important work.

About 1872, the tunnel of the N. Y. C. & H. R. R. R. Co. above the Grand Central Station in New York City was built and waterproofed with Coal Tar Pitch and Tarred Felt with less materials and skill than is employed in similar work at the present time. A few months ago, work on the new terminal improvements for the Company now in progress, necessitated the demolition of the south end of the old tunnel, unearthing some of this thirty-three year old waterproofing, which can now be seen by any one interested and which will be found to be absolutely unchanged in its waterproofing qualities.

LEADING Architects, Engineers and Waterproofing Contractors who have had occasion to note all that has been accomplished to date in this line, consider Coal Tar Pitch and Tarred Felt the standard materials for underground work for the simple reason that they have no equal in point of durability and economy for this important purpose, notwithstanding that each year brings its new crop of alleged improvements claiming to be better.

While we give no general specification for the application of Coal Tar Pitch and Tarred Felt for Waterproofing, for reasons which follow, we will state that even more important than in roofing is the employment of a waterproofing contractor whose experience and reputation for intelligent and honest work is assured. The mistakes of faulty waterproofing of underground construction are costly to rectify, particularly if a known water pressure is to be permanently resisted.

ACTUAL APPLICATION *of* WATERPROOFING

THE following photographs showing the operation of waterproofing the walls and floor of one of the new power houses now in course of construction in New York for the N. Y. C. & H. R. R. R. are given to illustrate the proper application of Tarred Felt and Coal Tar Pitch for that purpose.

In Nos. 1 and 2 are shown how the alternating layers of Tarred Felt and Pitch are applied, while



No. 1

in No. 3 a view of the floor surface shows the six plies or layers of Tarred Felt cemented together with Pitch, over which a final coat of Pitch is to be applied. The Concrete walls shown in all the photographs were built to receive the Waterproofing.

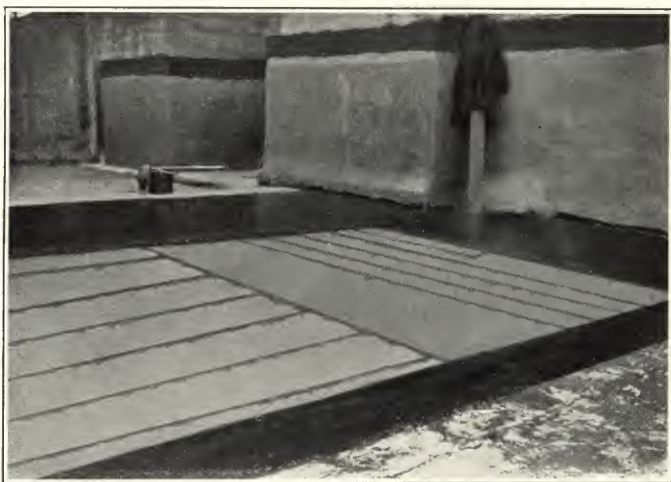
In No. 3 the side wall waterproofing, as shown, has been completed and plastered with a coat of Cement Mortar about one inch thick to protect the waterproofing from fracture while the main concrete wall of the building which is to be built up against it is being constructed.



No. 2

When the waterproofing of the floor surface is completed it will be covered with a heavy concrete mass of weight and strength sufficient to resist any pressure. The waterproofing is thus shown to be a continuous seal or lining covering the entire floor and extending up in the walls to a point above the water line.

IN general, the use of Coal Tar Pitch and Tarred Felt underground is applied to some form of masonry or concrete; if rough stone, the surface to be waterproofed must be plastered fairly smooth to receive the waterproofing, which consists simply of, first, a coat of Pitch, applied hot with a mop, then a layer of Tarred Felt with alternating layers of Pitch and Tarred Felt, until the requisite number is *solidly* and *securely* in place. The number of courses varies with the character of the work, from



No. 3

ten plies in a water pressure operation, to 2 or 3 where only the ordinary dampness of the earth is to be excluded. In large cities the application of this character of work is a trade in itself, requiring workmen of great skill under the direction of experienced contractors, who make a specialty of waterproofing the cellars and foundations of the most modern buildings. The method of applying alternating layers of Pitch and Felt to masonry is shown in a

general way in the "Barrett Specification Roof over Concrete," but it takes more skill and dexterity to do this work on a perpendicular wall than on a flat surface and the utmost care and knowledge is necessary to protect exposed edges and make the proper connections where the work must necessarily be suspended to be taken up later.

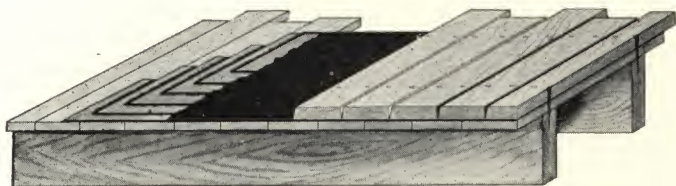
The cost of this class of work per square foot can scarcely be stated in a general or approximate way, owing to the wide range of conditions under which it is required. The waterproofing of concrete floors or vault arches above grade is fairly simple and may be done strictly along the lines of the Barrett Roof Specification over Concrete.



MODERN PITCH HEATING TANK FOR CITY WORK.

WATERPROOFING WOODEN FLOORS

THE wooden floors of breweries, abbatoirs, stables, etc., are frequently waterproofed as shown in the following sketch.



The felt and pitch are laid as shown in the roof specification over boards, the top course of plank should be laid in hot pitch and so nailed that the nails all enter the beams below, as nailing between beams is liable to cause leaks. The joints of the upper course of plank should be run with hot pitch.

This system is applicable to waterproofing between two layers of concrete, as in flooring or vault arches, over which a Portland Cement or other floor or sidewalk material is laid.

Waterproof floors laid similar to this method, consisting of at least two thicknesses of tarred felt placed between a double boarded floor, cemented together with pitch with the upper floor nailed while the pitch is in a tacky condition, secure an allowance of 5% in the schedule rate of buildings made by the N. Y. Fire Insurance Exchange—the object of this being to prevent damage by water in case of fire.

MILL FLOORS *Over* TAR CONCRETE

IN mills where a wooden floor is required, resting on the earth, the wooden floors are protected from dampness and decay, rats and vermin are excluded and a firm foundation for machinery afforded by the following method.

After the ground has been properly graded and settled, spread a concrete consisting of 20 gallons of hot Coal Tar to each cubic yard of cinders thoroughly mixed and spread over the surface to a depth of 5 to 7 inches, and rolled or tamped to the required grade, over which may be laid without sleepers 2 to 4-inch plank, over which is laid at right angles or diagonally, the wearing floor firmly nailed to the plank below. It is the custom of some builders to bed sleepers in the Tar Concrete on which to nail the first course of plank, while others apparently obtain as good results by omitting the sleepers. The raw Coal Tar thus used contains its normal quantity of creosote oils, the standard material for preserving timber. With advanced mill engineers, this method of constructing wooden mill floors on the earth is considered standard.

While the bulk of this Concrete is usually of the proportions of tar and cinders mentioned, the top inch is frequently made of sand and tar, which make a somewhat firmer concrete, and grades more satisfactorily than the cinders.

WHILE we have intended herein to cover in a general way all the chief uses of Tarred Felt and Coal Tar Pitch, in building construction, according to up-to-date methods (exclusive of the use of Ready or Prepared Roofings and building papers, as a separate department of the Company) we invite criticism as to omissions and hold ourselves ready to furnish any additional information on the subject to the interested reader.



FIRE RETARDENT QUALITIES *of Barrett Specification Roofs*

THE fire retardant qualities of all the Barrett Specification Roofs as compared with slate, tin, iron or ready roofing are well known to practical fire underwriters.

In the roofing laid over boards it is simply a question of which will resist the action of heat the longest and thus retard fire.

Numerous comparative fire-resisting tests have been made between Tin and Standard Coal Tar Pitch, Felt, and Slag or Gravel Roofing, in the presence of representatives of boards of fire underwriters and municipal building authorities, the results always showing the boards under the slag and gravel *unharméd*, when the same exposure to fire had *ignited* the wood under the tin.

The accompanying photographs show the result of a recent fire test between a Barrett Specification five-ply Gravel Roof and a Ready Roof



which is composed of one sheet of Tarred Felt and one sheet of burlap cemented together with a bituminous cement.

THIS grade of ready roofing is laid with the burlap side up and then coated with liquid coating or paint. Both the Barrett Specification and the ready roofing specimen were constructed according to the directions of the respective manufacturers, ten days before the fire test was applied, in order to give the coating on the ready roofing ample time to dry and harden. Kindling wood in exact equal proportions was placed on each specimen, and fired simultaneously. After burning for a space of time sufficiently long to entirely obliterate the ready roofing under the fire, and char the boards to a depth of $\frac{1}{4}$ -inch, it was found that the upper layer of the five layers of tarred felt in the Barrett Specification Roof was still soft and pliable and uninjured by the fierce fire which had consumed the other specimen.

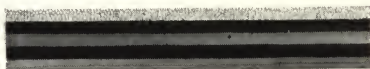
More interest than ever is now being taken in the comparative fire retardant qualities of the various methods and materials used for roofing over wood construction, and we are encouraged to believe that underwriters and building authorities will soon unite in the adoption of fixed standards for fire retardant roofings, with practical and simple methods for testing same. When just and proper regulations of this kind are established, the over-zealous manufacturer will be more guarded in the use of the term "fire-proof," and it will be demonstrated beyond question or doubt that a Barrett Specification Roof is a *standard fire retardant*.

READY *or* PREPARED ROOFINGS

THESE are used principally on roofs of considerable pitch, where the services of skilled roofers are not obtainable.

One of the best of these is the Amatite Roofing, which consists of two sheets of wool felt, saturated with pure Coal Tar. These are cemented together with straight-run Coal Tar Pitch.

AMATITE
COMPOSITION
TARRED FELT
COMPOSITION
TARRED FELT



The wearing surface is applied in the process of manufacture to the side to be exposed to the weather with a specially prepared bituminous compound, into which, while hot, is embedded a uniform and even layer of Amatite, the new non-conductive stone surface.

The surfaced fabric is then passed between heavy rollers, making a smooth, compact sheet of attractive appearance.

This roofing is a fire retardant in that it will not catch fire from sparks or embers falling on the surface.

It will require no painting nor attention of any kind for years after it has been put down. This roofing requires no skilled mechanic to lay it. In fact, any man can do the work by simply following the instructions. For steep roofs it is an exceptionally good article.

Amatite is put up in rolls 32 inches in width, containing 110 square feet, which is sufficient to cover 100 square feet of roof surface, including 3-inch laps.

With each roll is sent seven pounds of Amatite cement for laps (see directions for applying,) and one and one-half pounds large-headed galvanized iron nails, which do away with the use of the tin caps ordinarily used.

Another popular prepared roofing is the Black Diamond, one of the first ready roofings ever manufactured. This was about thirty years ago, since when the sales have aggregated millions of rolls. This test of time has so well established the service reputation of Black Diamond as to make it the standard 2 and 3 ply Ready Roofing of the country.

THE construction of Black Diamond 2 and 3 ply is clearly shown in the accompanying sectional diagrams.



Two-ply consists of two sheets (AA) of the best quality of Tarred Felt, with a layer of waterproof composition (B).

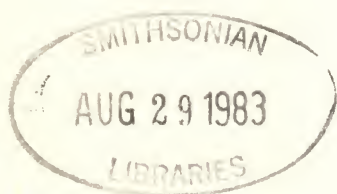


Three-ply consists of three sheets (AAA) of the best quality of Tarred Felt, with two layers of waterproof composition (BB).

Unlike Amatite, the Black Diamond is not ready surfaced, but requires coating when laid. This coating is prepared ready for the brush, and, like the roofing, can be applied by anyone.

Black Diamond is low priced and can be properly laid at but little expense. It is durable and lasting. Just give it ordinary care—an occasional coating which costs but little more than the time employed—and it will serve for many years.

There are many roofs where the best service obtainable can be secured only by the use of Ready Roofing. That the very best grades be used is an imperative specification, and either Amatite or Black Diamond Roofing will qualify in every requirement.





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